Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Sem. – IInd - Examination – June/July- 2011

Subject code: 1722603

Subject Name: DSP Architecture and Programming

Date:27/06/2011 **Time: 10:30 am – 01:00 pm**

Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Explain following terms with respect to Digital Signal Processors. **07**

(i) Data address paths
(ii) Delay slots
(iii) Functional unit latency
(iv) Execute packet

(b) Briefly explain major hardware components of TMS320C67x processors. **07**

Q.2 **(a)** Explain following TMS320C67x processor instructions with an example. **07**

(i) ADDAD (ii) DPINT (iii) LMBD

(b) Explain single precision and double precision floating point data representation with an example. **07**

OR

(b) Explain various addressing modes of TMS320C67x processor with examples. **07**

Q.3 **(a)** Explain following special function resisters of TMS320C67x processor with their significance. **07**

(i) Control Status Register (ii) Addressing Mode Register

(b) Write short note on Pipelining. **07**

OR

Q.3 **(a)** What you mean by resource constraints? Explain cross path and load/store constraints in detail. **07**

(b) Write short note on following. **07**

(i) Parallel Operations (ii) Conditional Operations

Q.4 **(a)** Write a C program that calls an assembly function to calculate the following: sum = 1! + 2! + 3! + 4! + 5! using C67x processor. **07**

(b) Write a C program that calls an assembly function that takes input values a and b from the C program to calculate the following: $[a^2 + (a + 1)^2 + (a + 2)^2 + \ldots + (2a - 1)^2] - [b^2 + (b + 1)^2 + (b + 2)^2 + \ldots + (2b - 1)^2]$ using C67x processor. Take a = 3 and b = 2. **07**

OR

Q.4 **(a)** Write an assembly language program using C67x processor to find convolution of following: **07**

$$x[n] = \{\underset{\uparrow}{1},2,3,4\} \quad \text{and} \quad h[n] = \{\underset{\uparrow}{1},2,3\}$$

(b) Write an assembly callable assembly language program using C67x processor to find maximum number among randomly stored Ten bytes from memory location 0100H onwards. Store result to location 0500H. **07**

Q.5 **(a)** Write short note on following. **07**

(i) EDMA (ii) EMIF

(b) What do you mean by code optimization? Explain in brief about optimization steps. **07**

OR

Q.5 **(a)** Explain in detail how dual-tone multi frequency (DTMF) tone is detected using correlation. **07**

(b) Write short note on DSP system design Using FPGA. **07**

****